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FIRST INVESTIGATION OF NOBLE GASES IN THE DENGLI H3,8 CHONDRITE

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The Dengli (H3,8) meteorite weighting 243,5 g is a find from the Karakum desert. It' s a complex microbreccia contaned unusual clasts which are more typical for regolithic breccias than for H-chondrites. Based on Xe and Kr contents and their isotopic composition, the Dengli doesn't differ significantly from other H-chondrites. Its exposure age is 7,6 Ma. That's near to common possible data of exposure age (6,2+0,2 Ma) of 350 H-chondrites. Dengli's K/Ar age (4,01 Ga) coincides with the same ages of many other H-chondrites. Thus the Dengli isn't regolithic breccia and it probably formed during accretion of its parent body.

Based on features of texture and chemical composition of olivine and low-Ca pyroxene he has been classified as H3,8 chondrite [1]. The meteorite has a chondritic texture, but irregular achondritic clasts and isometric SiO_2-bearing inclusions distinguished on composition from the meteorite-host were discovered. Therefore this meteorite can consider a complex breccia, for example, a regolithic breccia.

The purpose of this investigation was a verification of this assumption using isotopic peculiariteis of noble gases. The concentration of solar wind gases which are characterized by typical solar isotopic composition, should be much more in the regolithic breccia than in the ordinary chondrites.

The contents of Ar, Kr and Xe are very similar to other ordinary chondrites of petrologycal types 3-5 [2-5] (Tabl.1). Xe isotopic composition on any temperature step distinguishs from solar Xe (Fig.1) and resembles Xe of ordinary chondrites (there are average results for 16 H-chondrites [3-9]). Kr isotopic composition is within a rande of other H-chondrites (Fig. 2) and it differs as strongly from solar Kr as Xe. Distinct features of cosmogenic $^{38}Ar_c$ (Tabl. 1) were founded in isotopic composition of Ar_c. The majority of Ar_c was isolated at 900°. The consentration of $^{38}Ar_c$ is $4,18*10^{-9}$ sm^3/g, exposure age is 7,6 Ma ($P_{38}=0,055*10^{-8}$ sm^3/g) that is near to the maximum (6,3+0,2 Ma) of exposure age spread for 350 H-chondrites [10]. K/Ar age was estimated using the consentration of K=805+8 ppm and radiogenic $^{40}Ar=(2,94+5)*10^{-5}$ sm^3/g. The age is 3,73+0,10 Ga which is near to the ages of some H-chondrites: Zaoyang (H5)-4,13+0,10 Ga, Lunan (H6)-4,15+0,10 Ga [3], Gueni (H4)-4,20 Ga, 474192 (H6)-4,10 Ga, 474418 (H6)-4,20 Ga [11], but the ages of other H-chondrites are older or younger.

Though the Dengli has some specifically petrological features different from most of the H-chondrites, it has no evidence of solar wind exposure as confirmed by our investigations of noble gase . That suggests that Dengli should not be interpreted as a regolithic breccia.

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Tabl.1

Isotopic composition (^{130}Xe=1.000, ^{86}Kr=1.000) and concentration of Xe, Kr, and Ar in the Dengli (H3.8), 365.1 mg.

T^oC	^{136}Xe	^{134}Xe	^{132}Xe	^{131}Xe	^{129}Xe	^{128}Xe	^{126}Xe	^{124}Xe
800	2.24±4	2.63±7	6.47±13	5.18±10	7.11±14	0.472±20	0.0277±20	0.0222±20
900	2.20±8	2.40±10	6.63±25	5.43±22	7.25±30	0.504±40	0.0237±35	0.0247±35
1100	2.11±8	2.60±12	6.44±20	5.21±16	7.10±35	0.483±25	0.0232±30	0.0225±30
1300	2.01±3	2.38±3	6.24±7	5.08±5	8.34±8	0.507±10	0.0282±7	0.0272±7
1600	2.01±3	2.40±5	6.11±9	4.90±8	8.35±12	0.503±10	0.0293±12	0.0286±11
Total	2.04	2.41	6.24	5.06	8.17	0.502	0.0280	0.0269

T^oC	^{84}Kr	^{83}Kr	^{82}Kr	^{80}Kr	^{130}Xe $sm^3/g*10^{-12}$ STP	^{86}Kr $sm^3/g*10^{-12}$ STP	^{40}Ar $sm^3/g*10^{-7}$ STP	$^{38}Ar/^{36}Ar$	$^{40}Ar/^{36}Ar$
600							0.5	0.225	1522±10
800	3.22±13	0.594	0.677±40	0.139±10	1.7	11.5	38.9	0.285	1755±28
900	3.17±16	0.653	0.550±44	0.136±14	0.9	5.1	54.5	0.451	5050±200
1100	3.12±15	0.662	0.659±33	0.148±14	1.7	6.0	81.6	0.410	5988±156
1300	3.23±7	0.707	0.664±20	0.164±6	19.2	35.6	153.0	0.340	1443±15
1600	3.27±7	0.695	0.694±20	0.145±6	7.3	22.5	52.9	0.271	369±4
Total	3.23	0.681	0.667	0.152	30.8	80.5	381.9	0.310	1287±12

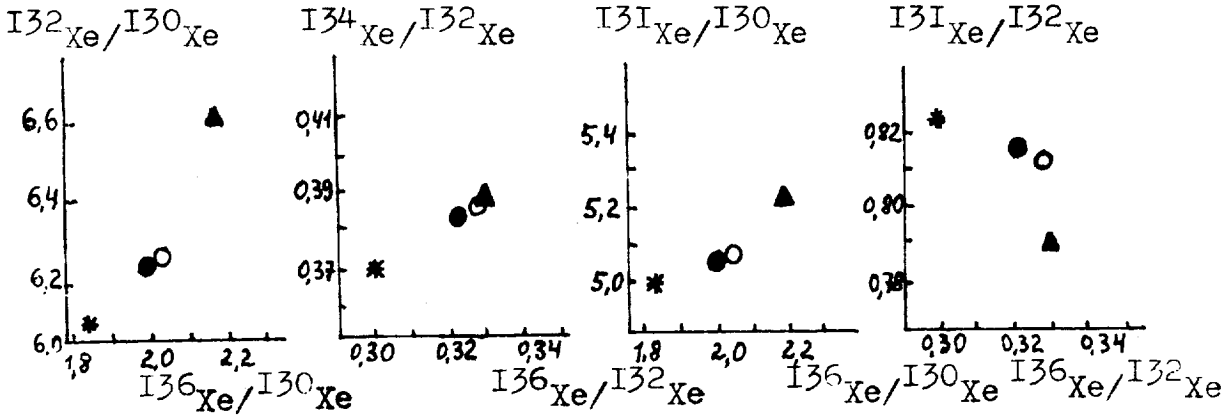

Fig.I

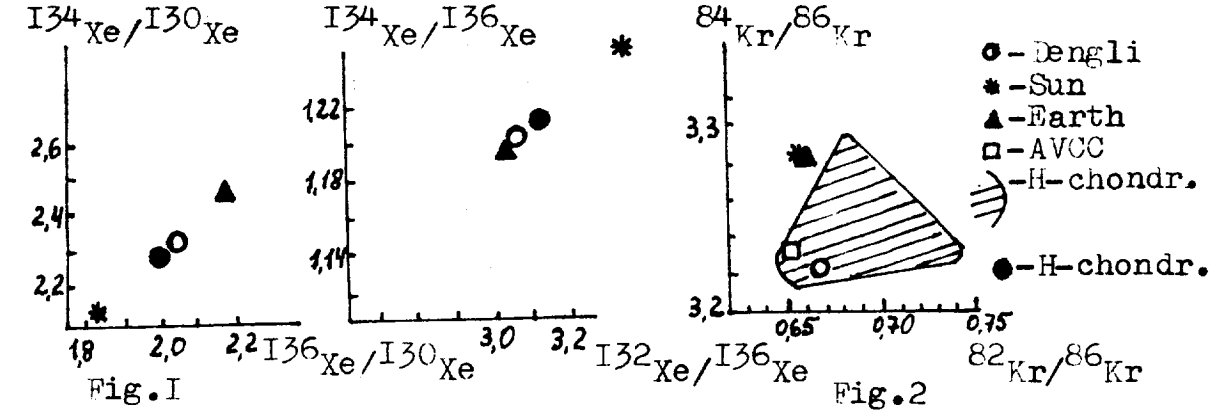

Fig.2